

AIR WAR COLLEGE

AIR UNIVERSITY

IMPLEMENTATION OF QUALITY AIR FORCE AT THE GROUP LEVEL
ORGANIZATION AND BELOW

by

Michael K. Deacy
Lieutenant Colonel, USAF

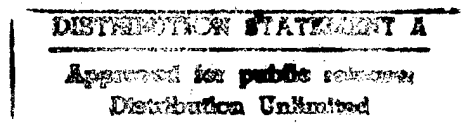
A RESEARCH REPORT SUBMITTED TO THE FACULTY
IN
FULFILLMENT OF THE CURRICULUM
REQUIREMENT

Advisor: Colonel Charles W. Ashley

MAXWELL AIR FORCE BASE, ALABAMA

April 1995

19970829 076



New Text Document.txt

19 AUGUST 97

This paper was downloaded from the Internet.

Distribution Statement A: Approved for public release;
distribution is unlimited.

POC:

AIR WAR COLLEGE
AIR UNIVERSITY
MAXWELL AFB, AL 36112

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED

DISCLAIMER

This study represents the views of the author and does not necessarily reflect the official opinion of the Air War College or the Department of the Air Force. In accordance with Air Force Regulation 110-8, it is not copyrighted, but is the property of the United States government.

Loan copies of this document may be obtained through the interlibrary loan desk of Air University Library, Maxwell Air Force Base, Alabama 36112-5564 (telephone (334) 953-7223 or DSN 493-7223).

ABSTRACT

TITLE: Implementation of Quality Air Force at the Group Level Organization and Below

AUTHOR: Michael K. Deacy, Lieutenant Colonel, USAF

The quality concept can be implemented effectively in Air Force organizations, group level and below. Commitment at all three levels of the organization--top leadership, middle management, and employee level--is the first prerequisite for implementation. This paper describes strategies to build and sustain commitment at each level. The second prerequisite for implementation is effective strategic and tactical planning. The strategic plan provides overall direction for the organization. The tactical plans, aligned with the strategic plan, implement quality in specific work areas.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Michael K. Deacy (MS, Air Force Institute of Technology) is a career communications-computer officer and has held a variety of assignments in that field. Most recently, he served as commander of the 1827th Electronics Installation Squadron, Kelly AFB TX where he helped implement the Quality Air Force concept. During the period in which the squadron implemented quality, it earned an Air Force Outstanding Unit Award and received the first Outstanding rating awarded by the Air Force Communications Command in over 11 years. Lieutenant Colonel Deacy is a graduate of the Air War College, class of 1995.

TABLE OF CONTENTS

DISCLAIMER.....	ii
ABSTRACT	iii
BIOGRAPHICAL SKETCH	iv

Chapter

I. INTRODUCTION.....	1
II. COMMITMENT.....	4
Top Leadership Commitment	5
Middle Manager Commitment.....	9
Employee Level Commitment.....	13
III. PLANNING	19
Strategic Planning.....	19
The 11-Step Model.....	21
The Longer View	25
Tactical Planning.....	26
Picture of a Quality Organization	27
IV. CONCLUSION	33
BIBLIOGRAPHY	35

CHAPTER I

INTRODUCTION

The United States Air Force, along with the rest of the government, was directed to implement the quality concept. Most often dubbed Quality Air Force, the path being pursued is derived from the teachings of several quality gurus--Dr Deming and Dr Juran foremost among them. Quality Air Force is not a direct application of any one theory, thus inviting much confusion as organizational commanders attempt to implement Quality and action officers and employees at large read the specific rules of Deming's "Total Quality Management" (TQM) or the differing rules of other quality experts. Although the Air Force Quality Criteria provide some means to judge if a "quality culture" exists, the Air Force has no one way of implementing Quality, but allows each command to choose much of their own guidance. Furthermore, unit commanders and their staffs at the group level and below have considerable leeway in determining how to implement the concept in their organizations. This provides one reason it is difficult to implement the quality concept in the military. For example, several of Deming's specific requirements for TQM are at odds with Air Force requirements and the Air Force is not changing (e.g., Deming refers to yearly personnel evaluations such as Officer Performance Reports as a deadly disease (42:36)).

However, taking a larger view, one can outline several benefits of a generic quality concept that may be understood as Quality Air Force. By amalgamating parts of the different quality theories, Quality Air Force could provide a framework of quality principles, tools, and specific procedures to guide Air Force leaders managing their organizations (10:3). While much of the Quality Air Force concept

seems to be just common sense, effective management, or good leadership, it is important to remember not everyone possesses those qualities and they do not always run organizations well just because they would apply. Many leaders, rather than just the exceptional, natural leaders, would be able to run a quality organization if they faithfully applied the framework provided in the quality concept.

Given the significant benefits that could accrue to the quality organization, one understands why our leadership insists on pursuing the concept of Quality Air Force. Most implementation guides for a quality concept cite several essential areas for success. The thesis of this paper is that commitment of the members of an organization and effective organizational plans are the only truly essential requirements for successful implementation of the quality concept. There are a number of excellent books describing how to implement the quality culture into an organization. Once the people in an organization become committed to the quality concept and make the effort to develop workable plans, it is relatively simple (albeit not easy) to learn and apply the specific tools and techniques used in a quality organization. The most difficult task is to develop commitment of the people to quality ideas such as continuous improvement, customer focus, teamwork, fact-based decision making, and decentralization sufficient to stay the course of planning and implementing a quality culture despite the upfront time and effort required (10:5). This paper will first explain the importance of commitment from the top to the bottom levels of an Air Force organization and provide real-world recommendations for effectively achieving, demonstrating, and sustaining such commitment. Then, the paper will detail the strategic and tactical planning requirements to transform the people's commitment into a successful, functioning quality organization.

CHAPTER II

COMMITMENT

In order to implement the quality concept in an organization, the commander is accountable for obtaining commitment of the organization's people. This is one point upon which virtually every author writing on quality agrees (10:129, 19:77, 32:24,36). The existing literature and the author's personal experience in the Air Force indicate this commitment, once attained and perpetuated, is almost sufficient alone to ensure successful implementation of Quality Air Force. Once the committed people of the organization develop their plans, from the top-level strategic plan down to the employee-level tactical plans, they will carry on and achieve the benefits of a quality culture.

There are three categories of people to deal with in discussing commitment. Related to each other in direct hierarchical order, these three groups cascade information from top to bottom in the traditional military manner. The first group is top leadership--the commander of an organization and those people who report directly to the commander. In Air Force organizations, group level and below, these individuals will range in rank approximately from captain through lieutenant colonel or GS-9 through GS-14. These people determine the direction of the organization. Although some members of this group may not appear to be top leaders in a traditional view (e.g., the one-deep safety representative, the secretary, etc.), they often have a far-reaching influence on other members of the organization due to their proximity to power of the commander, still an important factor in the hierarchical military organization. The next group is the middle managers, starting just below the top leadership on the organizational chain and ending just above the first-level supervisor. Middle management makes the critical link

between the leadership and workers, directly controlling the day-to-day operations of a unit. Despite often significant differences in middle manager grades and responsibilities in different size and type Air Force organizations, this group shares similar concerns and barriers with respect to the quality concept. The remaining employees, including first line supervisors, comprise the third and last group. These members accomplish most of the unit's production or service, and are most essential to successful accomplishment of the unit mission, as well as to the implementation of Quality Air Force in the organization. Each of the three groups described must commit to the quality concept if it is to succeed, and each group's commitment is influenced and demonstrated differently within the organization. All are necessary to effectively implement quality in a consistent, top-to-bottom style.

TOP LEADERSHIP COMMITMENT

Commitment of the top leadership of the organization is essential if the quality concept is to spread throughout the entire organization, and that commitment must be demonstrated if subordinates are to be expected to buy in to the new way of doing things (32:24). The first of Dr Deming's 14 points for implementing TQM states management must "Create constancy of purpose for improvement of product and service" (42:34). In keeping with this precept, top leadership in the corporate world must communicate their dedication to quality versus the normally perceived dedication to profit. A unique feature of leadership in a quality culture is the elevation of quality to equal status with cost and schedule, and often the behavior of leadership does not reflect this idea (40:11). Although Air Force organizations are not in business to make a profit, this principle applies in that military leaders attempt to maximize mission

accomplishment for minimum cost. Many a program manager has learned to balance cost and schedule with capability, where quality is part of the capability. Similarly, Air Force organizations provide products and/or services of some specific quality at a cost and on a schedule.

Subordinates at all levels of an organization pay significant attention to the behavior of superiors, and the top level leaders have great influence on employee beliefs and behavior. One poll conducted by the American Society for Quality Control found that employees detected large gaps between what chief executive officers (CEOs) said versus what they did concerning quality. For example, 18 percent believed while the CEO stated they must show customers a corporate commitment to quality, their actions did not validate their statements. The leadership can not afford to sacrifice quality for cost or schedule if they wish to nurture and spread the quality culture throughout the organization (11:30-31). If the top leadership's dedication to quality is demonstrably sincere, the remaining population of the organization will perceive this and be much more likely to use quality in their parts of the organization. If they perceive top leadership as hypocritical or unenthusiastic, they will not make any significant effort to implement quality, but continue to stress cost and on-time production. People naturally focus on those things the boss sees as important and how the boss tries to achieve them.

The commander can obtain commitment of the rest of the top leadership once they understand the quality concept and see potential benefits to both the organization and themselves (32:369). Top leadership personnel are the ones who decide to implement the quality concept into their organization and shape its implementation. Given this ownership of the decision, quality theory predicts those leaders would buy in to the concept readily. In addition, top leadership personnel are predisposed to some aspects of quality, such as using employee

inputs, if they have previously listened to their people's ideas and implemented good ideas from below. In fact, such practices can help supervisors rise to top leadership positions. Finally, top leadership does not see quality as a threat to their power or job--they are at the top of the hierarchy and make the rules of the organization (39:145-146). Being at the top of the management chain, leadership expects that increased success of the organization due to quality will increase their own recognition and rewards. Due to all these reasons, top leadership is not normally as bound to traditional management as those at lower levels of the organization.

Top leadership's most difficult task is convincing skeptical members of the organization of the leaders' commitment. For example, a study by Hassard, et. al., of an electronics company found that top leadership was fully committed to the quality concept, had made significant organizational changes based on quality, believed quality had changed the culture throughout the organization, and believed this view was shared at all levels. However, the study also determined the workers did not believe quality was extremely important to the organization; they sensed pressure for on-time production detracted from the emphasis on quality. Workers also stated supervisors focused on unimportant areas such as housekeeping standards to the detriment of quality issues. Finally, the company's method of implementing top down changes became less specific as it continued down the organization's levels. Thus, although top leadership truly believed in quality, they failed to consistently demonstrate their commitment in practice (2:216).

To avoid the problems experienced at the electronics company studied by Hassard et. al., top leadership must consistently and frequently talk about quality to unit members and use a variety of communications media to keep the concept visible and interesting. As one strategy, a unit commander can speak at

commanders calls, talk to individuals and small groups in the workplace or other places his people gather, and discuss quality in staff meetings or quality council meetings with his top leadership staff. In addition, he should distribute the quality message in writing to all members by posting or distributing copies of meeting minutes and policy letters.

Top leadership can also send a message through their involvement in quality activities. The commander and the rest of the top leadership must participate by examining and measuring their own processes and pursuing continuous improvement. Their participation sends a message that the leadership recognizes they also have problems and opportunities to improve; it's not "us against them" (39:20). They should also participate with employee-level members in process action teams that improve processes cutting across functional areas, further demonstrating commitment to the quality concept. As a squadron commander, this author participated on a team formed to streamline the process of creating temporary duty (TDY) orders in a high-TDY unit. Organization members from every level participated and shortened the process by about 25 percent. The most important effects though were the improvement process demonstrated in practice that employee inputs were solicited and used. In addition, top leadership supported the outcomes of a quality process, and a middle manager acted as team leader and effectively conducted team activities. Demonstrating the successful use of a quality technique did more to build unit commitment than any number of briefings or letters describing the importance of quality could do.

Even more important than continually verifying commitment, the top leaders must avoid undercutting their own credibility with subordinates. Despite the busy schedules of top leaders, they must make the time to reinforce their statements with behavior. Without such visible signs of commitment, one may reasonably expect lower level employees to conclude top leadership is not really

committed to quality. All too often, Air Force commanders and senior staff have touted the value of quality to their people, but then failed to personally take part in quality activities. This author has observed several senior leaders that have repeatedly canceled Quality Council meetings, delegated quality activities to a deputy, or abruptly dismissed inputs from subordinate levels. Lower level members of the organization quickly decide their leadership is paying lip service to a program they do not really believe in. Such a climate dooms the quality concept to failure.

Perhaps the most impressive example of top leadership commitment demonstrated in the Air Force occurred 11-13 Aug 90. The senior staff of (then) Military Airlift Command (MAC) held their planned three-day quality training program at Scott AFB IL to continue the MAC quality implementation. CINCTRANSCOM (also CINCMAC), General Hansford T. Johnson, felt it was important he attend and demonstrate his commitment to quality despite the fact his command began the movement of people and materiel in support of Operation Desert Shield on 7 Aug 90. He later noted that earlier quality initiatives developed by MAC contributed to the command's successful support of the operation. General Johnson clearly demonstrated his commitment to quality by attending the scheduled training program and empowering the command's deputies to run MAC operations during a critical stage of crisis. MAC provided exemplary support to the warfighters in Desert Storm, and not coincidentally, provides (as Air Mobility Command) an exemplary Quality Air Force concept to the Air Force today (38:5).

MIDDLE MANAGER COMMITMENT

Middle management, composed of senior noncommissioned officers and company grade officers or their civilian equivalents, resistance to implementing quality is a recognized barrier (10:133, 13:7, 39:72, 41:7). However, this level of the organization is key to the success of implementing quality because they must act as a conduit for bringing understanding of quality principles to the lowest level employees and back up their statements with evidence of their commitment (32:24).

Middle managers will often resist commitment to quality because many of the changes instituted in a quality culture detract from their power. Many middle managers realize they have gone as far as they will go in an organization and are more concerned with maintaining their position than improving their processes. Thus, middle managers are disposed to be uncomfortable with the concept of letting top leadership recognize they (middle management) do not know every detail about their areas (39:146). Middle managers can easily hurt and possibly kill an initiative to implement quality in an organization. They normally have a great deal of direct interaction with the employee level workers and can overtly or covertly sabotage many of the changes initiated by top leadership. They have a great deal of power relative to entry level employees and the employees often do not feel they have any effective protection from managers.

Another reason for weak middle management commitment is the enthusiastic top leadership may bypass them in the early stages and preach the quality bible directly to the employees of the organization. In implementing quality, it is important to involve the middle managers in developing plans for the change (10:133, 41:7). Lower level managers often had a significant role in developing the work environment of their own little kingdoms and see it as "the ideal status quo" (13:7). Logically, they will not welcome changes in the work place that might reduce their own prerogatives.

However, if quality is going to work in an organization, top leadership must obtain the commitment of middle managers. Middle managers must recognize what benefits could accrue to them if quality were to succeed. By improving in their areas, those middle managers that have not yet peaked in their careers may be able to advance to a top management position. A division of Thorn Lighting, a leading supplier of lighting solutions to 140 countries, successfully motivated lower level supervisors. The company trained workers to use teamwork in pursuing continuous improvement, and were rewarded through pay and promotions (26 upgraded to management over two years) linked to their performance. This group led the eight cells of the company involved in manufacturing for market responsiveness. An employee participation program oriented toward finding and eliminating defects in work resulted in a reduction of scrap from 3 percent to 0.4 percent over nine months, resulting in an average saving per month of 6,000 British pounds for 18 teams. Tangible benefits such as this support the use of quality techniques (2:217-218).

Others middle managers benefit by process improvements making their jobs easier. In addition, if one middle manager continues to resist the quality movement, he or she may lose ground to the others who improve more and more by practicing quality in their own areas (39:158). In addition, top leadership can always threaten the recalcitrant middle manager with loss of employment.

Top leadership must train middle managers to develop participative management skills and to consider the employees as members of the manager's team, thereby increasing commitment to quality. Under traditional management, middle managers learned accountability for absolute control over the processes in their areas. As a result, such managers find it difficult to allow subordinates to recommend changes or even raise an issue regarding problems in an area. However, senior leadership is responsible for teaching managers to emphasize

correcting problems and improving processes, not assigning blame for the problems identified. In addition, management must understand employees are accountable for making their proposed solutions work when they implement them (41:7).

Quality Air Force carries empowerment of people even further, giving employees authority to implement changes without prior management permission in many cases. Any organization that empowers its employees must provide clear guidance and accept the risk that some employees will make incorrect decisions, and be willing to accept the consequences (9:45). This concept, discussed further under employee level commitment, is an even greater challenge to those managers accustomed to working in the traditional mode of management.

Air Products, an international gas and chemical supplier, instituted a comprehensive training program to enhance the creativity and enthusiasm of its employees in continuously improving business processes (3:251). Acknowledging the difficulty of changing the outlook of employees used to holding close control of their processes, Air Products conducted awareness training and workshops to obtain commitment from virtually all its employees. Immediately after completing the workshops, employees began improving the processes identified as opportunities during awareness training. Enthusiasm and commitment were high, driving the early success of many quality improvement efforts. The company provided additional training in leadership and empowerment to the managers in an attempt to lower the level of decision making and let the customer drive control of employee activities. The company has continued to work on quality improvement and was recognized in the 1991 British Quality Awards for its use of quality in motivating its people (3:251-253).

Top leadership also can directly influence the middle managers and thereby increase their commitment to quality through job descriptions, evaluations, and recognition programs (41:7). By requiring participative management as part of a

civil servant's position description or describing it as part of a military person's job in a periodic feedback session, top leadership can ensure managers understand what is desired and have the opportunity to discuss any confusion concerning the changes. By citing the managers' successes on yearly evaluations, leadership can influence performance to a great extent in accordance with the old adage that people tend to do the things that bring rewards. Leadership should modify recognition programs that relate to managers to include consideration of quality factors. In fact, if recognition awards are consistently given to managers who do not support the quality initiatives of the organization, the program may significantly undermine the quality concept.

Just as top leadership sets the example for the entire organization, middle managers must provide a model for the employee-level members with regard to quality. Managers should apply quality techniques in their jobs and join with employees as members of quality teams that improve processes in a specific work area. This demonstrated commitment of middle management to quality reinforces the leadership's example and provides the foundation to build strong commitment at the employee level.

EMPLOYEE LEVEL COMMITMENT

If quality is important to an organization, everyone must be a part of the culture. If one person is rude to a caller, it may wipe out the effect of many hours and dollars expended in courting the customers (39:19). The employee level of the organization contains the bulk of the personnel and closest association with the nuts and bolts of an organization's processes. In many organizations, including those in the Air Force, employees also have the most contact with customers and

thereby personify the organization. Thus participation of employees is crucial to successful implementation of quality.

Modern day employees are more motivated by challenging work, the opportunity to be involved, making their own decisions, and "personal growth" than by higher pay or a secure job (35:3). They crave "feedback and recognition," "sense of achievement," and "influence" among their top motivators (40:186). Given these factors, one may reasonably expect such modern day employees of an organization to readily commit to the quality concept that promises to empower them and allow increased contribution to the success of their organization. Jobs in a quality organization are more congruent with employee motivation factors.

Globe Metallurgical, Inc. which produces automotive parts implemented quality to take advantage of the latent talents of its employees. While bringing employees paid by the hour into upfront planning, training them on quality, and making them accountable for the final inspection of products, the corporation has gained new customers in over 50 nations--in the competitive automotive industry. One vice president of the corporation stated the company policy is to try to implement every idea submitted through the quality process. These practices built strong commitment at the employee level as evidenced by the company's success. It won the Malcolm Baldrige National Quality Award as well as the Shigeo Shingo Prize for Manufacturing Excellence awarded by the government of Japan.

The most effective way to encourage commitment of the employee level to quality is through empowerment. This does not mean letting any employee do whatever he or she decides in the organization. It is more like letting every employee do what he or she decides on processes for which they are responsible and accountable. A person assigned to a job in the Air Force usually has some guidance and expected results. This author, as a squadron commander, used the following rule for empowerment. Employees accountable for obtaining results

could change their process as they wished as long as they did nothing illegal, unsafe, or that violated higher level guidance such as regulations. In addition, they could request a waiver or change to regulations when improvement of the process justified it. These simple rules kept the employees accountable for their part of the mission--their job, gave them a great amount of autonomy, and provided some assurance nothing truly damaging would occur, at least due to the empowerment aspect, because they still had to comply with regulatory and safety guidelines.

Members of the squadron cited above were surprised how many improvements could be made to their processes without violating the limits of their empowerment. During the early implementation of quality in the squadron, members requested relief from restrictions they had set or assumed on their own processes. The leadership's task was to help employees understand their leeway in accomplishing the mission. Once employees became accustomed to more autonomy, they improved their ability to discover opportunities for improvement in their processes. Such early successes, and management's willingness to risk letting employees make changes, quickly increased employee commitment.

The Air Force wishes to reduce the use of ozone depleting chemicals such as methylene chloride which has been used to strip paint from aircraft in depot. Management at Warner Robins Air Logistics Center (ALC) empowered a team responsible for stripping the paint from C-130 aircraft to devise a more environmentally friendly process. The team owned the process, knew the process better than anyone else, and reduced the amount of methylene chloride used from 37 to one barrel per aircraft. In addition, they reduced materiel costs by over 70 per cent (28:193-194). Work teams in a wide variety of mission areas could well make comparably great improvements in their own group or squadron processes when appropriately empowered.

Because there are many more employee level members of an organization than management and top leadership people, teamwork is most evident at this level. When employees are working in teams, either on a task or in improving a process, management should arrange to give the team authority and decision rights on their activity. This builds trust between management and worker, increasing the number of ideas offered and the willingness to take risks. As the perception spreads that everyone can contribute and teams can make decisions to implement improvements, process improvements will proliferate throughout the organization (39:56-57). This type of activity, obviously beneficial to the organization, continues to reinforce commitment of the individuals and opens the way to further improvements.

In Air Force Materiel Command's Electronic Systems Center, leadership determined recognition must be concentrated on teams to enhance continuous improvement of processes. The center recognized virtually any group of individuals working together in its subordinate organizations as bona fide teams qualifying for an award. Any individual could submit nominations for any team on a quarterly basis, and the Quality Steering Group could certify an unlimited number of submissions as winners (23:221-225). This program provides outstanding opportunity to recognize and reward organizational members who work cooperatively in teams to improve the processes for which they are responsible. Each team award has the potential to reinforce positive employee behaviors and their commitment to the quality concept.

The Milliken Contract Carpets company operates a great number of teams to work with processes, with customers, and with suppliers. The company solicits ideas through its "opportunities for improvement" program which has procedures to ensure every idea is seriously considered. The employee submits the idea to a supervisor who is to provide a response within 24 hours and thank the employee

for the suggestion. The supervisor also either explains why a submission does not qualify for action, starts creating a team to work the opportunity, or commits to speak to someone else when necessary and give a fuller response within 72 hours. The thanks given to employees are consistent with the company's policy of emphasizing non-financial rewards and attempting to recognize individuals in sharing success. The company receives a great number of ideas for teams to work on (44:317-318). The prompt response time constraints and accountability of the supervisor to give a response reinforce the employee's inclination to contribute ideas.

Whether due to fear, indifference, or whatever other reason, some employees will not immediately commit to quality and contribute to improving work processes. However, when the organization's leadership begins implementation of quality, members of the organization will be assigned to process action teams and work group teams to use quality techniques whether they volunteer to participate or not. These "non-voluntary" members witness quality team actions, like it or not, and observe the successes of teams in taking the "low-hanging fruit." By quickly implementing changes and saving resources or improving quality of output immediately, top leadership not only reinforces the commitment of "on-board" personnel, but eventually wins over those members that initially resisted implementation of the concept. These members have the potential to become the source of the second wave of new ideas as the original enthusiasts begin to run low on inputs (39:65).

The involvement of top leadership and management personnel as members of teams mostly made up of employees will reinforce employee commitment to the quality concept as mentioned briefly in previous sections of this paper. Employees must see their leadership actively sponsoring the new way of doing things before they will commit to change. In addition, the top leadership and management

personnel involved should be a source of expertise useful in improving the team dynamics, further benefiting the employee participants (11:69-70). The interaction of top leadership, normally far removed from day-to-day tasks, with the employees will close the loop of commitment to quality from the very top of the organization to those who must make the quality culture a reality.

CHAPTER III

PLANNING

Members of the organization, under the top leadership's direction, must develop and implement effective plans for successful quality concept implementation. Certainly, committed people throughout the organization can "think quality," but the quality of the organization will not improve significantly unless the people have plans they can use to change thought into effective action.

The plans must be proactive, cover all areas of the organization, and permit involvement of members from all levels of the organization (39:15-16). In addition, all members must clearly understand the plans, providing a picture of what the quality organization will be and what each member's participation will entail. The best way to provide such plans for quality is to link an organization-wide strategic plan down through the levels of the organization to specific tactical plans at the employee level.

STRATEGIC PLANNING

Strategic planning has been defined in several ways. One of the simplest definitions reads "a disciplined effort to produce fundamental decisions and actions that shape and guide what an *organization* (or other entity) is, what it does, and why it does it (6:xii)." Camillus describes strategic planning as a job reserved for the very top leadership of an organization, and which determines the organization's objectives, allocates the resources that will be used to achieve the objectives, and makes the policies for organizational use of the resources (8:18). St Lawrence and Stinnett state that limiting wide participation in creating the

strategic plan is a common problem that limits creativity, restricts feedback, and reduces understanding and commitment to the plan (37:57). The Government Performance and Results Act of 1993 gives specific requirements for each agency in submitting strategic plans for program activities. The plans must include a mission statement, goals and objectives, explanations for planned achievement of the goals and objectives, outside limiting factors that could impact achieving goals, and how goals are established and revised. The act also requires the strategic plan to look forward at least five years and be revised at least every three years (33:47). This high level guidance provides useful input to commanders at group level or below in devising strategic plans.

Obviously, strategic planning is not identical in the minds of all, but one can discern common elements in many of the definitions sufficient to describe the importance of strategic planning to successful implementation of the quality concept in an Air Force organization. At every level, including group and below, organizations should have a strategic plan to provide direction for where the organization is going and what it should be doing for success over the long term. The plan focuses unit efforts on attaining the desired end state. The public law's minimum of five years is an acceptable minimum span; five to twenty years might be appropriate as a range for Air Force groups and squadrons. Although the longer time frame may seem remote to units absorbed in daily operations, it will force attention to developing people and skills for a changing environment. Goals with supporting objectives, recognition of limiting factors, and involvement of top leadership seem to be non-controversial ingredients of a strategic plan. The vision for an organization is a responsibility of top leadership, or indeed the individual top leader (CEO or Commander) (30:12). Once the leadership provides the vision, wide participation of individuals throughout the organization in creating the

strategic plan would certainly improve implementation if one accepts the precepts of quality.

THE 11-STEP MODEL

The Air Force Quality Institute has provided an 11-step strategic planning process that encompasses all the essential components--from planning to plan to annual review of the plan. The 11 steps are outlined below, along with implementation strategies for use at group level and below.

The first step in strategic planning is planning to plan. During this step, necessary at every level organization, the planners must ensure the unit will make a serious effort to create a plan to guide their organization into a future that uses quality techniques to improve its important processes. This step requires the commitment, trust, and teamwork of the entire organization if the strategic plan will be a success (18:24-25). The actions required to build commitment at all levels of the organization described in chapter II, if successful, will have prepared the organization to create a valuable strategic plan. At the squadron commanded by this author, top leadership spent over two years concentrating heavily on developing commitment of unit members to the quality concept, conducting training in quality techniques, implementing process improvements, and building trust in the new, quality way of doing things. The leadership directed efforts at improving the processes that supported the traditional unit mission and five broad, annual squadron goals. When it was time to begin creating a strategic plan, essentially all unit members were bought in to quality and ready to participate constructively. While this is not a recommendation to wait over two years before beginning a strategic plan, doing the actions discussed in chapter 3 will create the proper frame of mind for those unit personnel who must work on the plan.

Once the planners determine they are ready to plan, they must carefully assess the values of their organization. In this step, the planners must assess how the organization's members feel about the perceived values. These feelings construct the culture of the organization and will influence many crucial decisions (18:25). For any Air Force organization embarking on this step, there is an easy start. The Air Force has articulated its overarching values, such as competence and service, and most organizations will have received additional input on values from their intermediate headquarters. Working with the values transmitted from above, the planners can add or modify as required and solicit feedback from the organization's members at large. On the basis of the feedback received, the planners can confidently list the values of the organization and consult them as they continue to develop the strategic plan.

The third step of the process is to analyze the unit mission. The mission analysis ensures the mission statement accurately describes the unit's reason for being. At the macro level, mission analysis must consider the factors that affect the mission, the customers and suppliers together with their requirements, the key result areas for the unit, and the key processes that achieve results (18:25-27). During this step, the planners must maintain a top level viewpoint and avoid getting too specific. Lower level employees will use the strategic plan as guidance in developing tactical plans for their areas of the organization.

The next step is envisioning the future which provides the foundation for the unit's vision statement, goals, and metrics (18:28). The vision for the organization points the direction, a task long recognized as a leadership responsibility. The vision must provide "a realistic, credible, attractive future" for the organization (30:8). The strategic plan must cover all areas of an organization, enabling all members to understand where they can contribute. Thus, there must be a lower

level plan or plans that flow down from the strategic plan for each sub-organization in which employees work.

When the commander of Warner Robins ALC in 1992 directed his senior managers to create a strategic plan, he provided broad guidance. He requested a strategic plan which would allow the ALC to "provide responsive, long term 'supplier of choice' customer support well into the next century (15:1)." Although at group level and below, an organization's mission is more narrowly defined, the unit commander should provide such general guidance to encourage the wide-ranging thought that results in significant improvements to an organization.

The fifth step is to assess current capabilities, how well key processes meet the requirements of the unit's customers. A unit self assessment using the Quality Air Force Criteria is a valuable measure of this capability (18:28). In 1994 this author's squadron conducted a self assessment and obtained a great deal of information indicating how well unit processes met customer requirements. To obtain useful information, the top leadership worked hard to eliminate fear in the middle managers and employees in the unit. By stressing the point the assessment would establish a baseline on which to improve, and drawing on the trust established in obtaining everyone's commitment to quality, the leadership overcame the natural reluctance to identifying less-than-flawless capabilities.

Step six of the model is to conduct a gap analysis by comparing current capabilities with the expected customer requirements of the future. The gaps identified provide the foundation for unit goals. In addition, too-large or too-small gaps indicate the planners should revise their view of the future to ensure a meaningful strategic plan (18:28).

The seventh step is to develop the goals and objectives for the organization that will fill the gap between the capabilities of the unit and the envisioned future state. Feedback on this area from the rest of the organization is crucial because

the tactical plans must contain subordinate, supporting goals and objectives (18:29). While developing the strategic plan, planners must establish significant goals to direct efforts to support the vision.

During this process the involvement and feedback of, ideally, all members of the organization can improve the plan and ensure a running start at the implementation. Two-way communication builds and reinforces the understanding of unit personnel and helps achieve buy-in to their plan. Participation at this stage will also prepare middle management and employees for their roles in developing and implementing tactical plans necessary to put rubber on the ramp later. Developing and implementing the strategic plan provides an opportunity to reinforce the commitment of the organization's people to the quality culture. Air Combat Command (ACC), under the leadership of General John M. Loh, turned their organizational chart upside down to demonstrate that leadership and management of the organization is there to support the employees (26:12). In this manner, ACC gives its people more of a stake in the success of the organization and encourages them to develop and work to achieve meaningful, challenging goals.

The eighth step is to create functional plans with the middle managers and employees to support the strategic plan. The functional, or tactical, plans delineate supporting processes that must align to the key processes identified earlier (18:29). There are important processes in each functional area of Air Force organizations that must support the higher level processes which accomplish the mission.

The ninth step is merely to implement the plans and begin changing the organization from its present state to the envisioned future state (18:29). The tenth step is to conduct a periodic review of progress on the functional plans and initiate changes required (18:30). Finally, the eleventh step is to conduct an annual review during which the planners assess progress across the organization, provide

feedback to the organization, and use the information obtained as input for the next planning cycle (18:30).

THE LONGER VIEW

Although strategic plan does not directly equate to long-range plan, the strategic plan must have a somewhat extended time frame. In many organizations, and certainly in the Air Force, the top leadership normally is a short-term incumbent rewarded for short-term successes. Active duty personnel at every level of the organization normally rotate on a shorter time horizon than the minimum five years applicable to strategic plans. Despite this difficulty, it does not negate the importance of strategic planning if the quality concept is to succeed.

That people tend to concentrate on the things they are evaluated on, and continue to do the things for which they are rewarded, is key to overcoming the problem of the short-term view. Institutionally, the Air Force must tie rewards to individuals' support of the strategic plan. If one accepts that the military is a calling rather than just a job, it seems reasonable that the longer people remain in the military, and the higher ranks they achieve, the more strongly they believe in their profession as such a calling. Therefore, at the highest levels of the Air Force, the rewards that tie individuals to support of the strategic plan are those motivated by selflessness and dedication to the service. These leaders, once convinced or educated as to the importance of strategic planning to the success of the organization, should strongly support the plan despite the enticements of short-term successes. On the practical side, these individuals, having reached significant ranks and achieved successful careers already, do not risk a career by falling short on a short-term endeavor.

At lower levels of the organization, although most people want to do well and often are very committed to the organization, there are more risks to face and real

possibilities to destroy a career. Realistically, to promote the implementation of Quality Air Force, these people must have specific connections between their support of the strategic plan and their rewards such as in their performance reports. The top leadership should clearly tell their subordinates their quality performance and strategic planning efforts will be reflected on their records. These leaders must then follow up on their words.

TACTICAL PLANNING

The tactical, or functional, plans are the plans that flow down from the strategic plan and provide the bottom line results. There may be a cascade of plans down several layers of an organization, each supporting the one above and providing guidance to the one(s) below or a one-to-one relationship of the organization's strategic plan to each tactical plan. Unless there is duplication however, there is only one strategic plan and all other plans supporting it are tactical in nature and focus the efforts of organizational members on getting things done.

This author has observed that employee level members often desire practical details concerning why the organization must implement the quality concept. In addition, members often ask for specific guidance for implementing the concept in their own work areas. It would be advantageous to consider the impact of personality when implementing quality in an organization. The Myers-Briggs Type Indicator (MBTITM) is a commonly used tool in Quality Air Force, and the Sensor-Judger (SJ) style, making up about 38% of the American population, has been shown to be a very common type of person in the military. In fact, approximately 48% of the general military population in 1985 (24:26) and 53% of students at the Industrial College of the Armed Forces (ICAF) in the years 1989-

1993 were SJ (24:28). If one accepts this style is common in the Air Force at large, one can believe that many Air Force members share the following characteristics with SJs. They tend to believe in and desire hierarchy, rules, and want to do "the right thing at the right time (22:39-47)." These type people would welcome a tactical plan that gives structure and understanding of what they do in a quality culture. This is not so much implementing quality in a non-quality way as giving people the type of guidance they need and want.

PICTURE OF A QUALITY ORGANIZATION

The tactical plan should first provide a mental picture to organizational members on what the quality organization will look like and what the people will do in a quality organization. The following provides a picture of a quality Air Force squadron with examples for implementation.

First, there are certain elements of quality culture that must be ingrained in (ideally) all members of the unit. In the ideal squadron, everyone from the different sections of the unit must work together as a team for the common good--to best accomplish the mission, not criticizing each other or trying to look good at others' expense. Supervisors in the organization use participative management, soliciting inputs from lower levels. Leaders discuss, shape, and implement the inputs to the maximum extent possible to improve unit operations. People really believe and behave as if "there is no limit to what the team can do as long as no one cares who gets the credit." There is strong loyalty up, down, and across the organization and fear is the enemy. In other words, all the people are empowered team members--they are trained in their areas and trusted to improve processes for which they are accountable. People are empowered to change processes which they own for the purpose of improvement as long as the change isn't unsafe, illegal, or in violation of higher HQ guidance (waivers may be requested when conflicts occur

with HQ guidance). In addition, all members of the unit understand and "buy into" the organization's vision, goals, and objectives, focusing all efforts on their realization.

The Federal Express company implemented this concept by implementing their "People First" environment, clearly explaining to their employees what was expected of them, what benefits they could expect in return, and what to do if they encounter problems. The leadership directly ties corporate goals to the needs and desires of the employees (1:15-16). As a result, Federal Express has become a model for quality implementation as well as becoming a Malcolm Baldrige Quality Award winner.

In a quality squadron, every work section must know who its customers are-- a list developed in discussions of team leaders and their workers. The list shows internal (to the squadron) and external customers. Anyone in the work section can go to something (e.g., a book, a wall poster, a computer file, their memory) and show or tell any visitor who their customers are. Initially, employees often resist this crucial step, believing it a waste of time. The top leadership of the squadron commanded by this author had to consistently reinforce the commitment of their employees to seriously work this issue. Leadership must then review the results and demonstrate the effort was a valuable exercise.

Similarly, every work section knows who its suppliers are. Again, any section member can show or tell who the suppliers are. This exercise is a useful cross-check because if a certain section lists someone as a supplier, but that supplier doesn't list the first one as a customer, there is a disconnect to correct. At the author's squadron, many people were eager to ensure their suppliers remembered to list them as customers. In fact, several sections learned to appreciate they had some customers they never considered. For instance, an installation section learned the administrative section could better provide forms

and publications when installations people provided requirements in a more timely, accurate manner. Both sections performed more efficiently and reduced friction between the people involved.

Complementing the section's list of customers, each section would have a descriptive, prioritized list of customer requirements for each of the internal and external customers. The work section team members must validate them by going over the list of prioritized requirements with the customers and getting feedback on first, how much the customers agree they are requirements; second, how well they are prioritized; third, how accurately the requirements describe what the customer needs (e.g., a performance report one day after close-out or 14 days after close-out--which is required?); and, fourth, what more or different aspects of the requirement did the customer want.

Federal Express maintained a clear and consistent customer emphasis for its employees, stating the company would obtain "100 percent customer satisfaction by performing 100 percent to our standards, as perceived by the customer (1:16)." This customer emphasis communicated clearly to the employees that the desires of the customer drove their activity. As stated earlier, the company tied employee rewards to their satisfaction of the customer. Their employees set their own objectives that must support the corporate objectives, and earn incentive compensation based on their success in meeting them (1:32-33). In an Air Force organization, supervisors may use a similar strategy to help subordinates establish their objectives supporting the organization's goals. In place of incentive pay, the Air Force leadership can provide other benefits of value to the employee. These range from public recognition to time off, depending on what the subordinate perceives as valuable.

Each work section's team members have a list of the processes they are stakeholders in that satisfy customer requirements. These processes should all

contribute to accomplishment of the squadron mission and be integrated into the squadron's framework of goals and objectives created to accomplish its mission and, ultimately, support the higher headquarters vision. Obviously, if a section has processes on which they expend time and effort (resources), but those processes don't match up with their goals, objectives, and mission, there is something wrong. The organization must adjust the processes or the goals.

Each work section has accurate flowcharts for their processes and any team member involved in the process can show and explain them to any visitors. Remember, this is the ideal quality squadron--initially, members start by flowcharting the most critical or problem-ridden processes so they can improve them first. The mere process of flowcharting processes can educate the employee to better understand his or her job.

All sections will have a method or methods of obtaining feedback from their customers on customer satisfaction and other indicators concerning the customers' requirements. Each team member would be able to show or tell what processes would be examined next for further improvement, based on customer feedback. Unit members would maintain the feedback data for at least five years to allow long term assessment of progress and provide input to the unit's strategic plan.

Each work section would have status of their action plans to improve the processes currently in work, and all stake holders would be able to show or tell that status. The status would normally include documentation of the data collected concerning the process being improved, appropriate charts (e.g., control charts) used to identify areas to concentrate on, plans to change the existing process in an attempt to improve it, and, finally, the new flowchart for the process.

After a work section improves a process that supports a customer requirement, it would collect data on the revised process and determine how much the process was (hopefully) improved. The data collected concerning processes

should be metrics--basically a meaningful measurement that tells one something significant about the process and allows one to act on it. The work sections will share the information with their customers, their supervisors, and the unit at large to show how they succeeded in improving important processes--with all results backed up by solid data in the form of metrics. At the squadron commanded by this author, such postings reinforced the positive feelings and commitment of the people who made the improvements and inspired other work sections to improve their processes similarly.

Throughout the tactical planning process, employee level input is essential to creating a workable plan as well as reinforcing commitment of the work force to quality principles. However, as noted earlier, employees often feel unprotected from their supervisors who may prefer the old way of doing things--supervisors directing and workers following orders. This author's experience determined the employee level of a squadron was most likely to be deterred by fear of the first line supervisor than any other factor. Federal Express instituted a guaranteed fair treatment procedure that ensured a series of higher management level boards heard complaints or grievances to ensure emphasis on employee satisfaction. The procedure allows employees to get management attention when supervisors lower employee performance reports. If the first review rules against the employee, he or she could appeal the case to higher levels, ending at the CEO's board. If that level, equivalent to a unit commander, fails to satisfy the employee, a board of review formed from Federal Express employees selected by a combination of the complaining employee and the board chairman. The complainant's peers, not just management personnel, make the final decision if the case comes to the board of review (1:42-46). In implementing the quality concept at an Air Force organization, a similar unit procedure or program may enhance the contributions of employees without denigrating the Air Force Inspector General system.

The middle managers and employees must create the tactical plans that implement the strategic plan for the entire organization. Given the commitment created previously, combined with frequent review and guidance from the top leadership, this combination of people will start and perpetuate a cycle of continuous improvement. Although the theory is simple, top leadership must consistently reinforce commitment, continue making the strategic plan relevant to the organization, and always demonstrate their participation in a visible manner. If the leadership fulfills their responsibility in this regard, the organization will maintain a steady course on the path to total quality.

CHAPTER IV--CONCLUSION

If the members of an Air Force organization are committed to the quality concept, then develop and implement effective plans, the organization can reap all the benefits of quality theory in practice. Three groups of organizational members--the top leadership, middle management, and the employee level--all must commit to the quality concept, demonstrate their commitment, and act appropriately to succeed.

Top leadership is responsible for pointing the way and leading by example. They must convince the rest of the organization through visible, consistent, personal actions that they believe quality is vitally important to the success of their organization. The organization's leaders must participate in quality activities with zest, despite the often urgent demands on their time if they are to motivate their subordinates to buy in to quality.

The middle managers, who often resist a change in organizational culture, must learn to tap the potential of their subordinates to improve the organization. To nurture middle management commitment to quality often requires training to use participative management, explanation of benefits that will accrue, and even coercive actions by top leadership. The commitment obtained is crucial in linking top management's vision to the activities of the employee level.

The employee members of an organization have the most potential to implement the quality concept, having the most direct involvement with both organizational processes and customers. The most apparent aspects of quality cultures, such as empowerment and teamwork, combined with regular reinforcement from above, will promote commitment in the employees of an organization.

After securing the commitment of all levels of the organization, unit personnel must develop strategic and tactical plans to convert quality orientation into implementation. The strategic plan will outline the vision of the organization, provide supporting goals and objectives to focus efforts, and induce organizational members to work towards the long term success of the unit. The tactical plans provide guidance at lower levels of the organization for aligning individual efforts in support of top level organizational goals. The tactical plans also provide a clear picture of what exactly members of the organization must do to create a quality unit.

Thus, it is apparent that commitment of each level of the organization to the quality concept, combined with effective planning, will ensure successful implementation of Quality Air Force. Once the members of the organization commit to the concept, it is straightforward to follow the implementation guides for quality. To make Quality Air Force a reality, organizational leaders must ensure commitment to quality is demonstrably wide spread in their organization. Then, all members of the unit must participate in creating and implementing plans for quality. Once done, the leadership can simply implement the quality concept in any Air Force organization.

BIBLIOGRAPHY

1. AMA Management Briefing, *Blueprints For Service Quality, The Federal Express Approach*, American Management Association, 1991.
2. Ashton, Chris, "The Dawn of a New Era?," *The TQM Magazine*, 4:215-219, Aug 92.
3. Atkinson, Roger, "Motivating People for Success," *The TQM Magazine*, 4:251-253, Aug 92.
4. Bahls, Jane E., "Managing for Total Quality: Practitioners Must Inspire Employee Involvement," *Public Relations Journal*, 48:16-20, Apr 92.
5. Bowles, Jerry, "Is American Management Really Committed to Quality?", *Management Review*, 81:42-46, Apr 92.
6. Bryson, John M., *Strategic Planning For Public And Nonprofit Organizations*, Jossey-Bass Publishers, San Francisco, CA, 1988.
7. Byham, William C. and Jeff Cox, *Zapp! The Lightning of Empowerment*, Fawcett Columbine, New York, NY, 1988.
8. Camillus, John C., *Strategic Planning and Management Control*, Lexington Books, 5.4. Heath and Company, Lexington, MA, 1986.
9. Carr, Clay, "An Approach to Empowerment," *Performance & Instruction*, 31:41-45, May 92.
10. Carr, David K. and Ian D. Littman, *Excellence In Government: Total Quality Management In The 1990s*, Coopers and Lybrand, Arlington, VA, 1993.
11. Cartin, T. J., *Principles and Practices Of TQM*, ASQC Quality Press, Milwaukee, WI, 1993.
12. Clark, Rolf, "TQM from the Trenches --The Role of the Individual," *Program Manager*, 21:28-32, Mar-Apr 92.
13. Dean, John, "Conveying 'the Big Picture' Is First Step in Involving Employees," *Total Quality Newsletter*, 3:7, May 92.
14. Duffin, Murray, "Leading by Example," *The TQM Magazine*, 4:1, Feb 92, 21-22.
15. Falldine, George, Memorandum dated 22 Feb 94, Subj.: WR-ALC Strategic Plan - Information Memorandum

16. Foy, Nancy, *Empowering People At Work*, University Press, Cambridge, Great Britain.
17. Frangos, Steve, "Empowerment: Using People to Achieve Excellence," *Quality Observer*, 1:6-7, Feb 92.
18. Holmes, MSgt Susan, *The Quality Approach*, Air Force Quality Institute, Air University, Maxwell AFB, AL, 1994.
19. Jablonski, Joseph R., *Implementing TQM: Competing In The Nineties Through Total Quality Management*, Technical Management Consortium, Inc., Albuquerque, NM, 1992.
20. Juran, Joseph M., *Juran On Leadership For Quality, An Executive Handbook*, The Free Press, A Division Of MacMillan, Inc., New York, NY, 1989.
21. Juran, Joseph M., *Juran On Quality By Design, The New Steps For Planning Quality Into Goods And Services*, The Free Press, A Division of MacMillan Inc., New York, NY, 1992.
22. Keirse, David and Marilyn Bates, *Please Understand Me: Character and Temperament Types*, Prometheus Nemesis Book Company, Del Mar, CA, 1984.
23. Kemp, Kelly, "Recognizing Teams--Your Next Priority!," *Quality Air Force Symposium Proceedings*, 220-227, Air Force Quality Institute, Maxwell AFB, AL, 1994.
24. Knowlton, Bill and Mike McGee, "Strategic Leadership and Personality: Making the MBTI Relevant," National Defense University, Industrial College of the Armed Forces, Washington, DC, 1994.
25. Lewis, Kevin and Mink, Oscar, "Fostering Quality Leaders: First Step Is to Unravel Resistance," *Total Quality Newsletter*, 3:7, Jan 92.
26. Loh, John M., *ACC Quality*, Air Combat Command, 1993.
27. MacDonald, John, "Reasons for Failure," *The TQM Magazine*, 4:237-240, Aug 92.
28. McDaniel, Joyce; Hawthorne, Linda; and Yates, Richard, "Empowerment--Service vs. Line Organization," *Quality Air Force Symposium Proceedings*, 190-197, Air Force Quality Institute, Maxwell AFB, AL, 1994.

29. Mintzberg, Henry, *The Rise And Fall Of Strategic Planning*, The Free Press, A Division Of MacMillan, Inc., 1994.
30. Nanus, Burt, *Visionary Leadership*, Jossey-Bass Publishers, San Francisco, CA, 1992.
31. Nolan, Timothy M., Leonard D. Goodstein, and J. William Pfeiffer, *Plan Or Die!, 10 Keys To Organizational Success*, Pfeiffer & Company, San Diego, CA, 1993.
32. Oakland, John S., *Total Quality Management: The Route To Improving Performance*, Nichols Publishing, NJ, 1993.
33. "Reinventing Government, "Government Performance and Results Act of 1993," *Leadership for the 90's and Beyond: A Quality Approach--NS 621*, 45-59, Air War College, Air University, Maxwell AFB, AL, 1994.
34. Richards, John D. (Lt Col, USA), "MR Insights: The Role of Leadership in TQM," *Military Review*, 72:84-87, Aug 92.
35. Rogers, Robert W., "Moving Toward High Involvement (of Employees)," *Quality Observer*, 1:3+, Jul 92.
36. Schwartz, Peter, *The Art Of The Long View*, Doubleday, A Division of Bantam Doubleday Dell Publishing Group Inc., New York, NY, 1991.
37. St. Lawrence, Dennis and Bob Stinnett, "Powerful Planning With Simple Techniques," *Quality Progress*, Jul 94.
38. Stratton, Brad, "The General Didn't Cancel," *Quality Progress*, 25:5, Jan 92.
39. Townsend, Patrick L. with Joan E. Gebhardt, *Commit To Quality*, John Wiley & Sons, New York, NY, 1990.
40. Tunks, Roger, *Fast Track to Quality*, McGraw-Hill, Inc., New York, NY, 1992.
41. Van Ness, Ross, "Worker Involvement: Wooing Managers Takes Incentives, Communication," *Total Quality Newsletter*, 3:7, Nov 92.
42. Walton, Mary, *The Deming Management Method*, The Putnam Publishing Group, New York, NY, 1986.
43. Weaver, Charles N., *TQM: A Step-By-Step Guide To Implementation*, ASQC Quality Press, Milwaukee, WI, 1991.

44. Williams, Melanie, "Wall to Wall Commitment," *The TQM Magazine*, 4:315-318, Oct 92.